calculating a flow of the circulatory system of the living subject based upon the corrected and forced simulation. [model; and

calculating a flow of the circulatory system based upon a selected blood flow perturbation.]

2. (amended) The method of modeling as in claim 1 wherein the [step of developing the model further comprises adopting] simulated circulatory system includes the Circle of Willis.

3. (amended) The method of modeling as in claim 1 [wherein the step of correcting the model further comprises selecting a vessel of the model] further comprising the step of calculating a flow of the circulatory system based upon a selected blood flow perturbation.

4. (amended) The method of modeling as in claim 3 wherein the [step of selecting a vessel of the model further comprises identifying a general area of a corresponding vessel in an image of the living subject] selected blood flow perturbation is a surgical alteration.

5. (amended) The method of modeling as in claim [4] 1 wherein the step of correcting the simulation to substantially conform to the living subject's anatomy further comprises selecting a vessel of the simulation and a corresponding vessel in an image of the living subject [identifying the corresponding vessel further comprises localizing the corresponding vessel in 3-dimensional space].

6. (amended) The method of modeling as in claim 5 wherein the step of correcting the simulation to substantially conform to the living subject's anatomy further comprises [localizing the corresponding vessel further comprises] measuring a diameter of the corresponding vessel in the image of the living subject.

7. (amended) The method of modeling as in claim 6 further comprising localizing the corresponding vessel in three-dimensional space and tracing [the] a boundary into adjacent areas in three-dimensional space to locate respective ends of the corresponding vessel.

8. (amended) The method of modeling as in claim 7 further comprising updating the [model] simulation based upon the measured diameter and locations of the respective ends of corresponding vessel.

9. (amended) The method of modeling as in claim 8 wherein the step of calculating [the cerebral] a flow further comprises using a one-dimensional, explicit, finite difference algorithm based upon a conservation of mass equation.

10. (amended) The method of modeling as in claim 9 wherein the step of calculating [the cerebral] a flow further comprises using a Navier-Stokes momentum equation.

11. (amended) The method of modeling as in claim 9 wherein the step of calculating [the cerebral] a flow further comprises using an equation of state relating a local pressure to a local artery size.

12. (amended) Apparatus for modeling circulation within a living subject, such ápparatus comprising:

a [pressure and flow model] computerized simulation model of an arterial circulatory system [for living subjects in general];

means for correcting the model of the circulatory system to substantially conform to a specific arterial anatomy [and physiology] of the living subject;

means for measuring a blood flow in the circulatory system of the living subject;

means for forcing the model with one or more flow parameters corresponding to a flow measurement obtained from the living subject; and,

means for calculating a flow and pressure of the circulatory system of the living subject

based upon the corrected and forced model[; and

means for calculating a flow and pressure of the circulatory system based upon a selected blood flow perturbation].

13. (amended) The apparatus for modeling as in claim 12 wherein the [cerebral] circulation model further comprises the Circle of Willis.

14. (amended) The apparatus for modeling as in claim 12 [wherein the means for correcting the model further comprises means for selecting a vessel of the model] further comprising means for calculating a flow of the circulatory system based upon a selected blood flow perturbation.

15. (amended) The apparatus for modeling as in claim [14] 12 wherein the means for [selecting a vessel of the model further comprises means for identifying a general area of a corresponding vessel in an image of the living subject] measuring blood flow is a phase contrast magnetic resonance flow measurement system.

16. (amended) The apparatus for modeling as in claim 15 wherein the means for correcting the model to substantially conform to the living subject's anatomy further comprises means for selecting a vessel of the model and a corresponding vessel in an image of the living subject [identifying the corresponding vessel further comprises means for localizing the corresponding vessel in 3-dimensional space].

17. (amended) The apparatus for modeling as in claim 16 wherein the means for correcting the model to substantially conform to the living subject's anatomy further comprises [localizing the corresponding vessel further comprises] means for measuring a diameter of the corresponding vessel.

18. (amended) The apparatus for modeling as in claim 17 further comprising means for localizing the corresponding vessel in three-dimensional space and tracing [the] a boundary into adjacent areas in three-dimensional space to locate respective ends of the corresponding vessel.

19. (amended) The apparatus for modeling as in claim 18 further comprising means for updating the model based upon the measured diameter and locations of the respective ends of the corresponding vessel.

20. (amended) The apparatus for modeling as in claim 19 wherein the means for calculating the [cerebral] flow further comprises means using a one-dimensional, explicit, finite difference algorithm based upon a conservation of mass equation.

21. (amended) The apparatus for modeling as in claim 20 wherein the means for calculating the [cerebral] flow further comprises means using a Navier-Stokes momentum equation.

22. (amended) The apparatus for modeling as in claim 21 wherein the means for calculating the [cerebral] flow comprises means using an equation of state relating a local pressure to a local artery size.

23. (amended) [Apparatus] A system for modeling circulation in a living subject, [such apparatus] comprising:

a [pressure and flow] computerized fluid dynamics simulation model of an arterial circulatory system [for living subjects in general];

a correction processor adapted to correct the model of the circulatory system to substantially conform to a specific arterial anatomy [and physiology]of the living subject;

a blood flow measurement device for obtaining a flow measurement from the living subject so that the model may be forced with one or more flow parameters corresponding thereto;

and

a flow processor adapted to calculate a flow and pressure of the circulatory system of the living subject based upon the corrected and forced model [and a flow and pressure of the circulatory system based upon a selected flow perturbation].

24. (amended) The [apparatus] system for modeling as in claim 23 wherein the [cerebral] circulation model [further comprises] includes the Circle of Willis.

25. (amended) The [apparatus] system for modeling as in claim 23 wherein the correction processor further comprises a cursor adapted to select a vessel of the model.

26. (amended) The [apparatus] system for modeling as in claim 25 wherein the correction processor further comprises a pixel processor adapted to process pixel data of the general area of the corresponding vessel to locate a boundary area between the corresponding vessel and surrounding tissue.

27. (amended) The [apparatus] system for modeling as in claim 26 wherein the pixel processor further comprises a distance processor adapted to measure a diameter of the corresponding vessel.

28. (amended) The [apparatus] system for modeling as in claim 27 wherein the pixel processor further comprises a tracing processor adapted to trace the boundary into adjacent areas in three-dimensional space to locate respective ends of the corresponding vessel.

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Please add the following claims numbered 51 through 55.

52. ~~51~~. (New) The method of claim 1 further comprising the step of obtaining a flow measurement in the living subject by magnetic resonance phase contrast.